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MARINE BORERS
THE SHIPWORM, MOLLUSCA
THE WOOD LICE, CRUSTACEA

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Forest Insect Investigations

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MARINE BORERS*

The Shipworm, Mollusca

The Wood Lice, Crustacea

Serious damage to the submerged portions of marine piling, wharves, or other wooden members, which remain fixed or floating in salt (and occasionally brackish) waters along the Atlantic and Gulf coasts, is caused by certain animals.

Extensive damage occurs in both Atlantic and Pacific coasts, chiefly in warm southern waters, but also to some extent in New England, Nova Scotia and even in Newfoundland where the waters are cold during much of the year. Under certain conditions they are capable of completely destroying untreated timbers in less than a year. Although no reliable estimates are available, it is believed that the annual damage caused by them runs into several millions of dollars. Recent information indicates that attack is restricted to the breeding season which lasts from 8 to 10 weeks, except on the Atlantic Coast north of New York where it lasts two months (July and August). Such infestation is dependent upon such factors as salinity, temperature, pollution, hydrogen-ion values, dissolved oxygen and sulferated hydrogen. Infestation is increased in warm waters where marine fauna grows luxuriently. It is retarded where streams are polluted which results in a lack of dissolved oxygen, and a concentration of hydrogen sulfide. With the mollusks, activity ceases when the water temperatures drop to just above the freezing point at which time the borers remain dormant. This is not so evident with the Crustaceans.

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There are two groups of marine borers, each characteristic in structure and method of attack. One the molluscan, a relative of the clams and the other a crustacean which is related to the lobsters. The former imbed themselves in the wood and are of more economic importance than the latter which are superficial borers, limiting their attacks to near the surface, principally between the low and mid-tide portions of piling where they are aided by the eroding action of water and debris in hastening the destruction of timbers. Under favorable conditions, it is reported that a 14 inch pile can be destroyed in a few months by the molluscan shipworms, whereas it requires at least a year for the crustacean borers to do this.

The Molluscan borers are represented by three important forms, as the wormlike Teredo and Bankia (commonly known as shipworms) and the clamlike Martesia. The free swimming young shipworms usually attack timbers near the mudline, using their rasplike shells to penetrate the wood at right angles to the grain. Thence they assume a longitudinal direction. As they bore, the body elongates and becomes wormlike and the burrows are lined with a calcareous deposit. The small opening to the surface serves to extrude two siphons, one to admit the water and much of the food, the other to expel it. In addition to small aquatic organisms, it is believed that wood is partly digested and serves as food. The opening to the exterior can be closed by means of a pair of plates to exclude unfavorable water or harmful organisms. The burrows are often from 1/8 to 1/4 inch in diameter and a few inches long where attack is heavy; under other more favorable conditions they may attain a diameter up to 1 inch and a length of 1 to 4 feet. Because their entrance holes are usually located near the mud line and are only 1/8 inch or less in diameter, the extensive destruction within piling is not always realized until it gives way under stress.

The clamlike appearing mollusks, the Martesia, like the shipworms have free swimming young which attack the timbers making entrance holes up to 1/8 inch in diameter. Once imbedded in the wood, they excavate it sufficiently to accommodate their bodies which are usually not over 2½ inches long and an inch in diameter when mature. They are capable of causing considerable damage to untreated timbers. Their distribution is believed to be limited to the shores of the Gulf of Mexico.

The Crustacean borers are quite distinct from the above mentioned forms in general structure, appearance and methods of attacking and destroying marine timbers. Both young and old burrow into timbers and are never imprisoned for life like the mollusks just mentioned. As stated previously these crustaceans are less destructive than the mollusks and usually confine their work quite close to the surface. Their attacks are mostly confined between low and half tide levels where the wood becomes eroded by water and debris coming against it, giving the piling an hourglass shape in that portion.

The crustaceans are also represented by three genera which are found along the Atlantic coast. They are Limnoria and Sphaeroma often called "wood lice" as they are related to and closely resemble the "sow bugs" and Chelura which belongs to the group containing the "sand fleas".

The wood louse Limnoria is the most destructive form of the three mentioned above, but of late it has been reported that the associated form Chelura is assuming greater importance in some localities.

L. lignorum is the most important species and is capable of reducing piling about an inch in diameter per year. It has seven pairs of legs with sharp claws to hold on to wood and a pair of toothed mandibles with which to bore into the wood which serves as its food. Being poor swimmers damage occurs slowly from a center of infestation. Its spread is usually by means of infested driftwood. When mature, Limnoria are from 1/8 to 1/4 inch long. They seldom penetrate directly into the wood more than 1/2 inch from the surface. Sometimes they make oblique galleries an inch or more long.

Sphaeroma, although slightly larger (up to 1/2 inch by 1/4 inch) making holes nearly up to 1/2 inch in diameter, is less numerous and less destructive than Limnora. It is a southern species. It is sometimes found working in fresh water.

Control: Although it is possible to control marine borers by the use of mechanical barriers and paints, standard pressure treatments of southern pine and Douglas fir, using coal-tar creosote, or creosote coal-tar solution, have been found to be most practical. Such timbers when thoroughly impregnated are estimated to last from 10 to 12 years or more under average conditions whereas untreated piling along the Atlantic and Gulf coasts is subject to being destroyed in a year or less. For more detailed accounts see Hunt 1938 and Clapp 1937.

Hunt, George M. and Garratt, G. A. "Wood Preservation"
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